1. An electro-absorption modulator comprising a semiconductor layer having an electrically controllable absorption, a material composition of the semiconductor layer being chosen so that the semiconductor layer is substantially transparent to light propagating though the semiconductor layer when a substantially zero or a reverse bias voltage is applied across the semiconductor layer at operating temperatures of the electro-absorption modulator that are substantially greater than 25 degrees Celsius.

2. The electro-absorption modulator of claim 1 wherein the semiconductor layer comprises a multi-quantum well layer.

3. The electro-absorption modulator of claim 1 wherein the semiconductor layer comprises a bulk semiconductor layer.

4. The electro-absorption modulator of claim 1 wherein a wavelength of the light propagating though the semiconductor layer is substantially 1310nm.

5. The electro-absorption modulator of claim 1 wherein a wavelength of the light propagating though the semiconductor layer is substantially 1550nm.

6. The electro-absorption modulator of claim 1 wherein the material composition of the semiconductor layer is chosen so that the semiconductor layer is substantially transparent to light propagating though the semiconductor layer when a substantially zero or a reverse bias voltage is applied across the semiconductor layer at operating temperatures of the electro-absorption modulator that are substantially greater than 35 degrees Celsius.

7. The electro-absorption modulator of claim 1 wherein the material composition of the semiconductor layer is chosen so that the semiconductor layer is substantially transparent to light propagating though the semiconductor layer when a substantially zero or a reverse bias voltage is applied across the semiconductor layer at operating temperatures of the electro-absorption modulator that are

substantially greater than 45 degrees Celsius.

8. The electro-absorption modulator of claim 1 wherein the material composition of the semiconductor layer is chosen so that the semiconductor layer is substantially transparent to light propagating though the semiconductor layer when a substantially zero or a reverse bias voltage is applied across the semiconductor layer at a maximum operating temperature of one of the electro-absorption modulator or a laser that generates the light.

9. The electro-absorption modulator of claim 1 further comprising an electronic data modulator having an output that is electrically coupled to a modulation input of the electro-absorption modulator, the electronic data modulator generating an electrical AC modulation signal having a peak-to-peak voltage amplitude that changes an absorption edge of the semiconductor layer, thereby changing light transmission characteristics of the electro-absorption modulator.

10. The electro-absorption modulator of claim 9 further comprising a thermal sensor that is in thermal communication with at least one of the semiconductor layer of the electro-absorption modulator and a laser that generates the light.

11. The electro-absorption modulator of claim 10 further comprising a temperature-driven controller having an input that is electrically coupled to the thermal sensor and an output that is electrically coupled to a DC bias voltage control input of the electronic data modulator, the temperature-driven controller generating a signal that causes the electronic data modulator to change a DC bias voltage of the electrical AC modulation signal.

12. The electro-absorption modulator of claim 11 wherein the temperature-driven controller includes a processor that uses a look-up table to determine the DC bias voltage.

13. An electro-absorption modulated laser comprising:

a) a laser that generates light at an output; and

b) an electro-absorption modulator comprising a semiconductor layer that is optically coupled to the output of the laser, the semiconductor layer having an electrically controllable absorption, a material composition of the semiconductor layer being chosen so that the semiconductor layer is substantially transparent to light propagating though the semiconductor layer when a substantially zero or a reverse bias voltage is applied across the semiconductor layer at operating temperatures of the electro-absorption modulator that are substantially greater than 25 degrees Celsius.

14. The electro-absorption modulated laser of claim 13 wherein the semiconductor layer of the electro-absorption modulation comprises a multi-quantum well layer.

15. The electro-absorption modulated laser of claim 13 wherein the laser comprises a distributed feedback semiconductor laser.

16. The electro-absorption modulated laser of claim 13 wherein the laser and the electro-absorption modulator are integrated onto a single substrate.

17. The electro-absorption modulated laser of claim 13 wherein the laser and the electro-absorption modulator are physically separate devices that are optically coupled.

18. The electro-absorption modulated laser of claim 13 further comprising a thermoelectric cooler that is in thermal communication with the laser.

19. The electro-absorption modulated laser of claim 18 wherein the thermoelectric cooler adjusts the temperature of the laser to change a wavelength of the light generated by the laser.

20. The electro-absorption modulated laser of claim 13 wherein a wavelength of the light generated by the laser is substantially 1310nm.

21. The electro-absorption modulated laser of claim 13 wherein a wavelength of the light generated by the laser is substantially 1550nm.

22. The electro-absorption modulated laser of claim 13 wherein a voltage sensitivity with respect to wavelength of the electro-absorption modulator is substantially the same as a voltage sensitivity with respect to wavelength of the laser.

23. The electro-absorption modulated laser of claim 13 wherein the material composition of the semiconductor layer of the electro-absorption modulator is chosen so that the semiconductor layer is substantially transparent to light propagating though the semiconductor layer when a substantially zero or a reverse bias voltage is applied across the semiconductor layer at operating temperatures of the electro-absorption modulator that are substantially greater than 35 degrees Celsius.

24. A transmitter for an optical communication system, the transmitter comprising:

a) a laser that generates light at an output;

b) an electro-absorption modulator having an electrically controllable absorption, the electro-absorption modulator comprising a semiconductor layer that is optically coupled to the output of the laser, a material composition of the semiconductor layer being chosen so that the semiconductor layer is substantially transparent to light propagating though the semiconductor layer when a substantially zero or a reverse bias voltage is applied across the semiconductor layer at operating temperatures of the electro-absorption modulator that are substantially greater than 25 degrees Celsius;

c) an electronic data modulator having an output that is electrically coupled to a modulation input of the electro-absorption modulator, the electronic data modulator generating an AC electrical modulation signal having a peak-to-peak voltage amplitude that changes an absorption edge of the semiconductor layer, thereby changing light transmission characteristics of the electro-absorption modulator and modulating the light generated by the laser;

d) a thermal sensor that is in thermal communication with at least one of the semiconductor layers of the electro-absorption modulator and the laser; and

e) a temperature-driven controller having an input that is electrically coupled to the thermal sensor and an output that is electrically coupled to a DC bias control input of the electronic data modulator, the temperature-driven controller generating a signal that causes the electronic data modulator to change a DC bias voltage of the electrical AC modulation signal.

25. The transmitter of claim 24 wherein a wavelength of the light generated by the laser is substantially 1310nm.

26. The transmitter of claim 24 wherein a wavelength of the light generated by the laser is substantially 1550nm wavelength.

27. The transmitter of claim 24 wherein a voltage sensitivity with respect to wavelength of the electro-absorption modulator is substantially the same as a voltage sensitivity with respect to wavelength of the laser.

28. The transmitter of claim 24 wherein the material composition of the semiconductor layer of the electro-absorption modulator is chosen so that the semiconductor layer is substantially transparent to light propagating though the semiconductor layer when a substantially zero or a reverse bias voltage is applied across the semiconductor layer at operating temperatures of the electro-absorption modulator that are substantially greater than 45 degrees Celsius.

29. A method of generating data modulated light, the method comprising:

a) generating light;

b) propagating the light through a semiconductor layer having an electrically controllable absorption, a material composition of the semiconductor layer being chosen so that the semiconductor layer is substantially transparent to light propagating though the semiconductor layer when a substantially

zero or a reverse bias voltage is applied across the semiconductor layer at operating temperatures of the electro-absorption modulator that are substantially greater than 25 degrees Celsius;

c) elevating the temperature of the semiconductor layer above 25 degrees Celsius;

d) applying a DC reverse bias voltage across the semiconductor layer; and

e) applying an AC electrical modulation signal having a peak-to-peak voltage amplitude across the semiconductor layer, the modulation signal changing an absorption edge of the semiconductor layer, thereby modulating the light.

30. The method of claim 29 further comprising:

a) measuring a temperature of at least one of the semiconductor layers and a laser that generates the light; and

b) changing the DC reverse bias voltage across the semiconductor layer in response to the measured temperature.

31. The method of claim 29 further comprising:

a) measuring a temperature of at least one of the semiconductor layers and a laser that generates the light; and

b) changing a bias current driving a laser that generates the light in response to the measured temperature.

32. A method of tracking a temperature of an electro-absorption modulator to a temperature of a semiconductor laser, the method comprising:

a) generating light with a semiconductor laser;

b) propagating the light through an electro-absorption modulator comprising

a semiconductor layer having an electrically controllable absorption, a material composition of the semiconductor layer being chosen so that the semiconductor layer is substantially transparent to light propagating though the semiconductor layer when a substantially zero or a reverse bias voltage is applied across the semiconductor layer at operating temperatures of the electro-absorption modulator that are substantially greater than 25 degrees Celsius;

c) applying an AC modulation signal having a DC reverse bias voltage and a peak-to-peak voltage amplitude across the semiconductor layer, the modulation signal changing an absorption edge of the semiconductor layer, thereby changing light transmission characteristics of the electro-absorption modulator and modulating the light generated by the laser;

d) measuring a temperature of the semiconductor laser that generates the light; and

e) changing at least one of the DC reverse bias voltage and the peak-to-peak voltage amplitude of the electrical modulation signal, and a bias current through the laser in response to the measured temperature.